

REMARKS

Claims 10-17 and 54-85 are pending in the present application. Claim 16 has been amended, claims 18-37 have been cancelled, and new claims 54-85 have been added in this response. More specifically, claim 16 has been rewritten in independent form without narrowing the scope of this claim.

In the Office Action mailed January 11, 2005, claims 10-15 and 17 were rejected. More specifically, the status of the claims in light of this Office Action is as follows:

(A) Claim 16 was objected to as being dependent on a rejected base claim, but was indicated to be allowable if rewritten in independent form to include the features of the claim from which it depends; and

(B) Claims 10-15 and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,864,178 to Yamada et al. ("Yamada").

A. Response to the Claim Objection

Claim 16 was objected to as being dependent on a rejected base claim, but was indicated to be allowable if rewritten in independent form to include the features of the claim from which it depends. Claim 16 has been amended accordingly, and therefore the objection to claim 16 should be withdrawn.

Although the applicants' attorney agrees with the Examiner's conclusion that claim 16 is allowable, the applicants' attorney notes that the claim may be allowable for reasons other than those identified by the Examiner and does not concede that the Examiner's characterization of the terms of the claim and the prior art are correct.

B. Response to the Section 102(b) Rejection

Claims 10-15 and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Yamada. For the reasons described below, Yamada fails to disclose or suggest all of the features of these claims.

1. Claim 10 is Directed to a Method for Packaging a Microelectronic Substrate Including Removing at least a Portion of a Generally Non-conductive Material to Form a Gap Between Neighboring Conductive Couplers

Claim 10 is directed to a method for packaging a microelectronic substrate including providing a microelectronic substrate having a first surface, a second surface facing opposite from the first surface, and a plurality of first connection sites at least proximate to the first surface. The method further includes disposing flowable, electrically conductive couplers at the first connection sites, disposing a generally non-conductive material between the conductive couplers, selecting a gap dimension based on a target underfill material flow rate, and removing at least a portion of the generally non-conductive material to form a gap between neighboring conductive couplers. The gap has the selected gap dimension in a direction generally normal to the first surface of the microelectronic substrate. The method further includes connecting the microelectronic substrate to a support member by attaching the conductive couplers to second bond sites of the support member, and flowing an underfill material into the gap at approximately the target underfill material flow rate.

2. Yamada Discloses a Semiconductor Device Including a Circuit Board, a Semiconductor Chip Mounted to the Board, a Plurality of Bump Electrodes Electrically Coupling the Chip and Board, and a Resin Disposed Between the Chip and Board

Yamada discloses a semiconductor device including a wiring circuit board, a semiconductor chip mounted to the circuit board, a plurality of bump electrodes electrically connecting the wiring circuit board to the semiconductor chip, and a resin. The resin is disposed (a) between the chip and the circuit board and (b) around the periphery of the chip. In several embodiments, the resin around the periphery of the chip can be "dissolved and removed through a sequence of processes comprising light-exposure and development." (Yamada, col. 16, Ins. 46-48.)

3. Yamada Fails to Disclose or Suggest a Method for Packaging a Microelectronic Substrate Including Removing at least a Portion of a Generally Non-conductive Material to Form a Gap Between Neighboring Conductive Couplers

Yamada fails to disclose or suggest a method for packaging a microelectronic substrate, including, *inter alia*, "removing at least a portion of the generally non-conductive material to form a gap between neighboring conductive couplers," as recited in claim 10. Rather, Yamada discloses removing a portion of the resin disposed around the periphery of a semiconductor chip so that "the area of the resin layer is confined to the same size as that of a semiconductor chip." (Yamada, col. 16, Ins. 43-44.) As such, Yamada's method does not include removing resin to form a gap between neighboring bump electrodes. Moreover, one of ordinary skill in the art would not be motivated to modify Yamada's method to remove resin deposited between neighboring bump electrodes because Yamada explicitly teaches away from such a modification. Specifically, regarding such an opening between the chip and board, Yamada states, "water may be accumulated in the space 81, corroding the bump electrode 73." (Yamada, col. 2, Ins. 47-48.) Accordingly, Yamada fails to disclose or suggest removing at least a portion of a generally non-conductive material to form a gap between neighboring conductive couplers. Therefore, the Section 102(b) rejection of claim 10 should be withdrawn.

Claims 11-15 and 17 depend from claim 10. Accordingly, the Section 102(b) rejection of claims 11-15 and 17 should be withdrawn for the reasons discussed above with reference to claim 10 and for the additional features of these claims.

C. New Claims 54-85 Are Patentable Over Yamada

New claims 54-59 depend from claim 10. Accordingly, new claims 54-59 are patentable over Yamada for the reasons discussed above with reference to claim 10 and for the additional features of these claims.

New claims 60-71 depend from claim 16. Accordingly, new claims 60-71 are patentable over Yamada for the reasons discussed above with reference to claim 16 and for the additional features of these claims.

New independent claim 72 has, *inter alia*, features generally analogous to the features of claim 10. Accordingly, new claim 72 is patentable over Yamada for the reasons discussed above with reference to claim 10 and for the additional features of this claim.

New claims 73-85 depend from claim 72. Accordingly, new claims 73-85 are patentable over Yamada for the reasons discussed above with reference to claim 72 and for the additional features of these claims.

D. Conclusion

In view of the foregoing, the claims pending in the application comply with the requirements of 35 U.S.C. § 112 and patentably define over the applied art. A Notice of Allowance is, therefore, respectfully requested. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned at (206) 359-6465.

Respectfully submitted,

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Date: April 15, 2005

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